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CONNECTION TO NATURE IN PARK VISITORS: A LOOK AT STRUCTURED
AND UNSTRUCTURED RECREATIONAL ACTIVITIES

by

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A THESIS

Presented to the Faculty of
The Graduate College at the University of Nebraska
In Partial Fulfillment of the Requirements
For the Degree of Master in Science

Major: Natural Resource Sciences

Under the Supervision of Professor Mark E. Burbach

Lincoln, Nebraska

May, 2010

CONNECTION TO NATURE IN PARK VISITORS: A LOOK AT STRUCTURED AND UNSTRUCTURED RECREATIONAL ACTIVITIES

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There is evidence that park visitation is on the decline (Pergams & Zaradic, 2008) and if this is the case, and budgets decrease proportionately, there is a chance park land will be lost. Definitive explanations of the decline in park visits and time spent in nature are not available. In addition, there has been some discussion and research pertaining to the possible effects on people of not going into the natural environment and experiencing a connection with nature.

This study represents the first research known to focus on connectedness to nature and its relationship to structured and unstructured recreational activities. To test this relationship, a post-test only control group design was used to survey visitors at state parks. The Multi-dimensional Connection to Nature Scale was used to measure connectedness to nature in campground visitors. This paper presents results of participation in structured and unstructured activities. A significant positive relationship was found between connection to nature and participation in structured activities. This result supports the contention that participation in structured activities at a state park can increase a person's connection to nature. Some of the causes underlying this finding could include the intimate outdoor setting for outdoor programs and the information being provided during a program. For infrequent park users, there was no significant difference between connection to nature and participation in structured and unstructured activities. This study will greatly benefit the state park system by providing useful

information to park personnel. Park managers and planners can develop proper management and planning programs to make the most of the visitors' experience and better achieve the park's objectives.

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CHAPTER I

Introduction and Problem Statement

According to the recent work of Pergams and Zaradic (2008), after 50 years of steady increase, *per capita* visits to U.S. National Parks have declined since 1987. Before this, *per capita* National Park visits had increased from 1939-1987. In addition, in March of 2007, the National Park Service, U.S. Department of the Interior, stated that national park visits are continuing a downward trend (American Trails, 2007). The Midwest region of the U.S. led with a 5.0% decline, but the Western region had the most drastic cumulative decline, losing over one million visitors. All regions, except Alaska, showed a relative decline in park visitors.

This raises some environmental and social concerns, especially in the Midwest because there are fewer parks to visit. If park visits decline, there is a chance park land will be lost because parks cannot afford to operate with decreased funding. Definitive explanations of the decline in park visits and time spent in nature are not available. In addition, there has been some discussion and research pertaining to the possible effects on people of not going into the natural environment and experiencing a connection with nature.

Richard Louv (2005) and Aldo Leopold (1949), discussed certain disconnects from nature associated with decreased exposure to nature and possible implications. In his book *The Last Child in the Woods*, Louv (2005) discusses the 'Nature-Deficit Disorder' and how it is affecting children in America. This book has popularized the importance of spending time in nature and that today's children are not being raised with meaningful contact with the natural world (p.10-11). In the past, children have played and

worked primarily outdoors, but during the last few decades, such interaction with nature has almost disappeared.

One consequence of industrialization and urbanization is that people are spending more time indoors in both leisure and work life (Pergams & Zaradic, 2006). In another related article, Stiffler (2007) discusses how contact with nature can actually benefit kids in numerous ways, reducing symptoms of hyperactivity and attention-deficit disorders. Further, Kuo & Taylor (2004) examined the impact of reasonably "green" or natural settings on attention-deficit/hyperactivity disorder (ADHD) symptoms across a diverse population of children. Their research concluded that green outdoor settings appear to reduce the symptoms of ADHD in children all across the demographics they tested.

Due to the declines in park visitation and increase in urbanization, there may be some that feel disconnected from nature. Pergams and Zaradic (2006) researched "videophilia," the new human trend focused on sedentary activities involving electronic media. This study found that internet, video game, and home movie use is significantly increasing, while direct contact with nature through other outlets, such as national parks, is decreasing. They theorize that such a shift could hurt future biodiversity conservation movements. National park visits are one indicator of how much people in the United States are interacting with nature.

Also, Zaradic and Pergams (2007) argue that conserving biodiversity may depend on our appreciation of nature's intrinsic values. Therefore, if people are not spending time in nature, conservation efforts based on the intrinsic value of nature will not do as well in the short term as an effort based on the importance of ecosystem services. In other

words, less value will be placed on natural areas and experiences because people are not spending as much time in the natural environment.

In addition, childhood development could be impacted for future generations (Zaradic & Pergams, 2007). Such scenarios have resulted in several health hazards like increasing obesity in early childhood (Anderson et al., 1998). Francis (1988) argued that children's play in an unstructured environment, preferably a natural one, gives children a genuine understanding of reality. Fjørtoft (2001) argues that the outdoor environment represents a dynamic and rough terrain (e.g. slopes and rocks) that challenge motor activity in children and therefore helps them develop basic motor skills.

Sally Collins, U.S. Forest Service, Associate Forest Service Chief, stated that there needs to be more people willing to discuss wildlife and land conservation challenges of the future (2007). The largest challenge is to get more Americans, especially younger generations, involved in nature and conservation. She has noticed people disconnected from everyday resources used in life and their understanding of where those resources come from. She gives examples of stories she heard about college students surprised to learn that wood actually comes from trees. If this is true, it raises important concerns for future conservation movements.

Being disconnected to nature could lead to serious environmental problems. Heerwagen and Orians (2002) argue that a child's direct experience in nature plays an important role in developing positive attitudes about nature. In addition, activities such as fishing, hunting, and bird watching lead to consistent pro-environmental attitude and knowledge (Responsive Management, 2003). This makes it very important for not only children, but adults to directly experience nature and feel connected to their natural

surroundings. Without actually being in nature and experiencing it first-hand, people will not see environmental degradation or human impact. Direct experience in nature is the most immediate feedback of human's impact on the environment (Shultz, 2000). Without this interaction and feeling of connectedness, people in urban settings may ultimately prefer built settings to the natural environment (Heerwagen & Orians, 2002), which would result in a further decline in visitation to recreational parks.

Without direct contact with nature, and knowing that children will be the future leaders of environmental protection, there is a concern for environmental generational amnesia (Kahn, 2002). This is the predisposed nature of children to take the current conditions of the environment as normal, even though environmental degradation is slowly increasing (p. 102). In other words, each generation will accept the current environmental conditions as they increasingly deteriorate. Not only has outdoor play and nature experience been proven beneficial for a variety of developments in children, it can serve as a useful tool for environmental conservation and preservation. This reinforces the importance for people, mainly children, to directly experience nature and make some kind of connection with their natural surroundings.

With serious negative consequences of not connecting to nature, there needs to be more research in this area. There has been a lot of research conducted on environmental attitudes (e.g. Dunlap & Van Liere, 1978, Dunlap, Van Liere, Mertig, & Jones, 2000; Scott & Willits, 1994; Arcury, 1990), but little has been done in regard to connectedness to nature (Mayer & Franz, 2004). Shultz (2000) argues that it is extremely important to feel connected to nature and measuring one's feeling of connectedness to nature is

important for progress to be made on environmental issues. Thus, a connection to nature would lead to a concern for nature.

Finally, there are different ways to experience nature. The more traditional idea would be to go out into a state or national park and experience nature in a sense of solitude. Some outdoor recreational activities, structured or unstructured, can help people feel connected to nature. For this study, structured activities are defined as any activity lasting for more than one hour led by an environmental interpreter. Unstructured activities are those activities not directed by an environmental interpreter lasting more than one hour. In structured activities, environmental interpreters have the opportunity to educate and act as a role model for park visitors. Simply learning about nature can increase environmental sensitivity (Greenbaum, 2005), but to a much lesser degree than actually experiencing natural areas (Responsive Management, 2003). In unstructured activities, such as a solo nature hike, visitors that haven't experienced much nature may not know what to do when they get outside. In these cases, their nature experience would greatly benefit from an environmental interpreter in a naturalist program to help foster a connection to nature.

Purpose Statement

The purpose of this study was to determine whether participants in structured activities had a greater connection to nature than those that engaged in unstructured activities. In addition, this study looked specifically at whether infrequent park visitors that participated in structured activities had a higher connection to nature than those that participated in unstructured activities.

Research Questions

The following questions will be used to guide evaluations:

1. For both frequent and infrequent park visitors, do participants in structured activities have a greater connection to nature than participants that engage in unstructured activities?
2. For infrequent park visitors, is connection to nature greater in participants in structured activities than in participants that engage in unstructured activities?

Definition of Terms

Connectedness to Nature: Connectivity describes an awareness of likeness between the self, others, and the natural world (Dutcher, Finley, Luloff, and Johnson, 2007). The experience of connectivity involves disbanding of boundaries and a sense of a shared or common essence between the self, nature, and others.

Structured Activities: For this study, this is defined as any activity (e.g. hikes, fishing, rock climbing, horseback riding, etc.) lasting more than one hour led by an environmental interpreter.

Unstructured Activities: Activities not directed by an environmental interpreter (e.g. solo hikes) lasting more than one hour.

Infrequent Park Visitors: For this study, visitors that have visited a park less than one time in the past year.

Delimitations and Limitations

This study was narrowed to visitors in one state park offering structured and unstructured activities. The target population was individuals at least 19 years of age. This study was also limited because visitors may immediately feel a sense of

connectedness to nature, but that could quickly dissipate upon returning to their homes.

In addition, with this sample population, the study only looked at park visitors and how they are connected to nature. It does not look at individuals that don't visit parks and their connection to nature.

Significance of Study

This study represents the first research known to focus on connectedness to nature and its relationship to structured and unstructured recreational activities. This is significant in that there may be a relationship between these categories. This study will greatly benefit the state park system by providing useful information to park personnel. Park managers and planners can develop proper management and planning programs to make the most of the visitors' experience and better achieve the park's objectives. Managers and planners have complete control over ranger-led and environmental interpreter programs and activities provided and they need to determine their effectiveness in positively influencing connectedness to nature in park visitors.

CHAPTER II

Literature Review

This chapter begins with a review of the literature on connectedness to nature and other types of relationships to the natural environment. In addition, this section will discuss studies involving environmental attitude and provide reasons why measuring connectedness to nature is a better depiction of individuals' relationships with the natural environment. This review will also discuss the relationship of recreational activities on environmental attitude and connectedness to nature. There will also be a brief section on the role of the environmental interpreter. Finally, this review will illustrate the link between structured and unstructured activities and connectedness to nature.

Connection to Nature

Motivations to visit a park include escape (Galloway, 2002), solitude (Thapa, Confer, & Mendelsohn, 2004), being close to nature (Luo & Deng, 2002), and social interaction (Galloway & Lopez, 1999). Other reasons include stress relief (Galloway, 2002), recognition from others (Thapa, et al., 2004), and to enjoy/learn about nature and family relations (e.g. Wight, 1996). The possible benefits of connectedness to nature are the impetus to take an in-depth look at the role of structured park visits and determine whether they actually influence connectedness to nature. Mayer & Franz (2004) concluded that there is a growing consensus that individuals in the Western world need to change their behavior and consumptive patterns to achieve an environmentally sustainable society.

Due to industrialization and urbanization, there has been a general shift away from close contact with nature (Zaradic, Pergams, & Kareiva, 2009). In addition, more

people are spending additional time indoors in all aspects of their life. There are some scholars who believe that feeling connected to nature is indeed important and that it supports ecologically sound behavior (Zaradic & Pergams, 2007). There are others that think a sense of belonging to the natural community is required in order to secure environmental protection (Leopold, 1949, p. 204). Along with a sense of community, Roszak (1995) argues that a person's sense of self must be expanded to include the natural world, and as a result of this, destroying the environment would be, in essence, self-destruction. Finally, Pergams and Zaradic (2007) found that direct experience in nature is important to conserving biodiversity and other pro-environmental projects.

There have been many studies done involving environmental attitudes, values, and behavior. Pro-environmental attitude is defined as the recognition that human activities are altering our ecosystem and dependent wildlife, and have acknowledged the necessity of achieving more sustainable forms of development and resource management (Dunlap et al., 2000)

In one study regarding values and voting intentions, Vaske and Donnelly (1999) found that participants' attitude about wildlife preservation predicted behavioral intention to vote for preservation of wildlands. Stewart and Craigs' (2001) results suggest that frequent experiences of a naturally functioning ecosystem, such as a park or wilderness area, was more strongly linked to conservation attitudes and pro-environmental behavior than frequent experience of a constructed environment, such as a zoo. Scott and Willits (1994), on the other hand, found in a state wide survey that Pennsylvanians expressed support for the New Environmental Paradigm (NEP), a device used to measure

environmental attitude, but they were not likely to engage in activities that contribute to environmental protection.

Vining and Ebreo (2006) surveyed households at different points in time to investigate changes in general environmental concern (measured by the NEP), specific recycling attitudes, and recycling behavior that occurred as recycling opportunities became more available. Results indicated an increase in the number of households that recycled as well as the volume of materials recycled. The study also concluded that recyclers exhibited a stronger pro-environmental attitude than non-recyclers. Steel's (1996) findings also suggest that attitude intensity is correlated with self-reported environmental behavior and political activism in environmental issues.

If there is indeed a link between attitude and behavior, a different approach would be to study how pro-environmental attitudes are obtained. Shultz (2000) proposes that concern for environmental problems is linked to the degree in which people see themselves as part of nature. He proposes that environmental concern is tied to a person's notion of self and the degree to which people define themselves as independent, interdependent with other people, or interdependent with all living things.

Further, just as a relationship between two people can deepen and become more interconnected, so too can a person's relationships with nature. Environmental concern among people who view themselves as part of nature will have a strong desire to gain rewards for all living things or to avoid harmful consequences for their surroundings (Shultz, 2000). In addition, Shultz (2000) has proposed that environmental concerns are associated with empathy, and feeling included in nature can be produced by taking the perspective of animals being harmed by nature (biospheric) or people being harmed in

nature. By realizing the affects on wildlife by human actions, it contributes to a sense of community and connectedness to nature that allows them to have alternative perspectives that include compassion for nature and animals.

Shultz (2000) also states that it should be possible to develop environmental education programs that evoke feelings of empathy or inclusion that lead to biospheric environmental concerns, thereby changing environmental attitude. His research further suggests that any activity that reduces an individual's perceived separation between nature and themselves will lead to an increase in that individual's biospheric concern. This could be any activity, structured or unstructured, where a person is feeling empathy for nature. In contrast, simply learning about nature in a classroom or participating in destructive motorized activities in parks could actually decrease an individual's biospheric concern.

Mayer and Franz (2004) found connection to nature is an important predictor of ecological behavior and subjective well-being. They concluded that various factors can be viewed as contributing to overall life satisfaction, and connectedness to nature appeared to be as important a contributor as other variables associated with subjective well-being. Further in their discussion, they posited that such a feeling of connectedness to nature leads to eco-friendly acts. They also concluded that performing eco-friendly acts could lead people to feel more connected to the natural world, further deepening their relationship with nature.

There is little research on connection to nature and how it influences ecological behavior. However, there is some evidence and theory that supports the idea that feeling connected to nature is a strong predictor of ecological behavior and concern (Nisbet,

Zelenski, & Murphy, 2009). In addition, the feeling of inclusion can lead to biospheric concerns and a change in environmental attitude (Shultz, 2000). The research measuring environmental attitude, however, has been inconsistent (Hini, Gendall, & Kerns, 1995, Dunlap & Heffernan, 1975); therefore, measuring connectedness to nature may be a better approach because it could influence pro-environmental concern, attitude, and behavior.

Structured and Unstructured Activities

All participation in nature activities, however, may not generate the same support for conservation and there is need to understand what type of nature recreation produces the strongest commitment to conservation. The following studies demonstrate benefits to participation in nature based activities, but these studies do not explicitly examine the possible differences in structured and unstructured nature based activities. This section examines the benefits of participating in outdoor recreation activities and explains why splitting recreational activities in structured and unstructured activities are a better way to study the possible benefits.

Although not conclusive, a number of studies have found a positive, though modest, relationship between participation in outdoor recreation activities and environmental attitudes (e.g. Bikales & Manning, 1990; Dunlap & Heffernan, 1975; Jackson, 1986, 1987). Dunlap and Heffernan (1975) researched the association between participation in environmental recreation and environmental concern. They argued that participation in outdoor recreation influenced a commitment to preservation. Their results showed a weak support for their hypothesis, but did indicate that the association between outdoor recreation participation and environmental concern needed further investigation.

They also noted that when a person has a strong emotional attachment to a specific recreational activity, that person will want to protect the environment that helps them participate in that activity (1975). In other words, outdoor experiences are likely to influence whether individuals would be more inclined to adopt ideas involving preservation, management and protection of natural areas.

Further, Dunlap and Heffernan (1975) argued that people might experience some form of education during recreational activities that would help shape their environmental beliefs. Educational materials could consist of bulletin boards, naturalist programs, visitor center, or contact with park employees. Together, these factors have the potential to shape a positive environmental attitude among visitors to recreational parks. Beaumont's (2001) study on ecotourism and environmental knowledge indicates that ecotourism can increase environmental knowledge and influence various conservation views and behaviors. For this study, the definition of ecotourism included occurrence in a natural setting along with ecologically sustainable environmental education.

In addition to Dunlap and Heffernan (1975), there have been studies on the relationship between a person's level of environmental attitude and participation in outdoor recreation (Thapa & Graefe, 2003; Jackson, 1986; Tarrant & Green, 1999). The results support the idea that participation in outdoor recreation is positively associated with environmental attitude. Also, the type of recreational activity influences environmental attitude.

In another study, Bustam, Young, and Todd (2003) found that when participants ranked the most important influences on their personal level of environmental sensitivity, the most frequently selected choice was outdoor experience in their youth followed by

outdoor experiences as an adult. This indicates that outdoor recreation could have an influence on environmental sensitivity. What we do not know is how these experiences influence their relationship with nature or connectedness to nature to help develop environmental sensitivity. This is where further research is needed.

A study performed by Weiler and Ham (2004) found that ecotourism's benefits include the promotion of pro-environmental attitudes and behaviors. The study also concluded that ecotourism can increase environmental knowledge and influence conservation views and behaviors. State parks can use the tourism industry to provide economic benefits in addition to providing valuable education to help people connect to nature (Stein, Anderson, & Thompson, 1999).

Due to the lack of consistency in studies of environmental attitudes, researchers have suggested that pro-environmental behaviors may be a better indicator of the association of participation in outdoor recreation and environmentalism (Theodori, Luloff, & Willits, 1998; Teisl & O'Brien, 2003). Theodori et al., (1998) found there was a positive relationship overall between participation in outdoor recreation and pro-environmental behaviors. Similarly, while most people who visit parks may be interested in the environment, only those involved in intensive outdoor activities are highly active in conservation and similar groups (Beckmann, 1993; Ballantine & Eagles, 1994; Hvenegaard, 2002). Driver and Brown (1975) state that recreation should be viewed as more than a leisure activity with the experience providing various benefits or rewards to participants.

Zaradic et al. (2009) studied the impact of nature experience and the willingness to support conservation. Their results showed correlations between the type and timing of

nature exposure and amount of later conservation investment. They concluded there are effectively two Americas when considering the pathway from nature exposure to conservation support: an elite backpacking/hiking group and a broader public lands visitation group. This study split up the activities into hiking or backpacking and public lands visitation or fishing.

Graefe, Thapa, Confer, and Absher's (2000) study on trip motivations to one national forest categorized participants as wilderness users, scenic area users, campground users, horseback riders, and adjacent landowners. This leaves out the programs offered by park employees completely, which could be an important part of a person's visit to a park. Activities can also be classified into three groups: appreciative (e.g. hiking), consumptive (e.g. hunting), and motorized (e.g. dirt biking) (Jackson, 1986; Geisler, Martinson, & Wilkening, 1977; Teisl & O'Brien, 2003). The research that divided up recreational activities into these categories has generated inconsistent findings (e.g. Theodori, Luloff, & Willits, 1998; Thapa & Graefe, 2003). As a result, Thapa and Graefe (2003) concluded that future research is needed to examine specific recreational activities rather than using the appreciative, consumptive, and motorized orientation framework.

Zaradic et al. (2009) hypothesized that people are more likely to invest in what they have personally experienced. Their results suggest that the type and timing of nature experience may determine future conservation investment. Rather than examining specific recreational activities, splitting the activities into structured and unstructured would be a better approach. Focusing on structured activities specifically addresses the influence of social interactions with park employees on connectedness to nature. In the

next section, the role of the environmental interpreter will be reviewed and deemed an important component in visitors' experience.

The Role of the Environmental Interpreter

For this study, environmental interpreters are defined as employees of parks that provide education in an outdoor setting that helps visitors understand the meanings of the phenomena on display, while simultaneously whetting the curiosity for more information (Ford, 1986). Education can be an effective means of managing tourists' interaction with wildlife and the natural environment (Orams, 1997). Combining specifically designed environmental education programs and firsthand nature experiences is an important component to conservation in natural environments (Charters, 1996).

Research in variables affecting visitor satisfaction (e.g. Fletcher & Fletcher, 2003; Weiler & Ham, 2004), and a preference for park ranger presence by backcountry visitors (Manning, 1999) shows that park employees can significantly affect park visitors' experience. State parks rely on tourism, and tour guides are one of the key components of this industry (Ap & Wong, 2001). Because tour guides and environmental interpreters are, in essence, the face of the park, their knowledge and interpretation of the park's landscape and history can change tourists' sojourn from a visit into an experience (Ap & Wong, 2001). In addition, Weiler and Ham (2004) found that tour group visitors had higher satisfaction levels than independent travelers both with interpretive and non-interpretive services.

Weiler and Davis (1993) recognize that a tour leader has the responsibility to contribute to environmentally responsible behaviors in their visitors. Environmental interpreters should influence visitors' long-term knowledge and attitude towards the

environment. The tour guide can be a good role model and could have an influence on behaviors and environmentally sensitive attitudes (Forestell 1993; Kimmel 1999).

Therefore, the role of the tour guide in meeting the tourist's expectation and the delivery of interpretation is critically important (Holloway 1981; Cohen 1985; Geva & Goldman 1991; Orams 1999).

In another study on education in natural environments, Ballantyne and Packer (2002) found that education performed in nature has as an important impact on students' attitudes towards the environment. As a result, they had a greater desire to be stewards of the environment and improve their behavior in natural areas and household environmental practices. They also concluded that combining observation with instruction is a powerful teaching strategy. Any activity involving a park employee, whether a speaker or guided hike, can combine observation with instruction and positively influence environmental attitude in a park visitor.

In addition, Ferreira (1998) found that hiking could play a role in environmental education by exposing people to environmental degradation and increase awareness of these problems. A guided hike could then help develop a basic understanding of these problems and result in feelings of concern and raise environmental attitude. Finally, in a study by Wight (1996), respondents were asked to rate the importance of various features during a visit at a national park. Quality guides were found to be an important component of ecotourism. The general consumer ranked guides and interpretive programs as more important than experienced ecotourists.

Studies of outdoor education programs indicate that those who have the least environmental experience and lowest initial environmental attitude scores will be

influenced most by involvement in such programs (Dresner & Gill, 1994; Lisowski & Disinger, 1991). The literature suggests that for infrequent park visitors, the tour guide can have a positive influence on the visitor's experience and environmental attitude. These components together can help the visitor feel more connected to nature. In the last section, the three previous sections will be formally linked together to form hypotheses.

Linking Connectedness to Nature to Recreational Activities

According to a study by the American Recreation Coalition (ARC, 2000), the most environmentally committed people participate in outdoor recreation the most frequently. This study also identified a correlation between the frequency of outdoor recreational activity and the level of environmental activism. As discussed in the introduction, direct personal experience with nature is a key component of developing a relationship with nature. According to Charters (1996, p. 84), experiencing nature first hand allows a person to obtain a greater understanding of the values of the resource. By understanding the value, it leads to appreciation and that appreciation leads to a desire to protect.

In addition, feeling comfortable, enjoying the nature experience, and feeling competent to be safe and secure with nature is important to forming a positive relationship with nature. In contrast, relationships will not form if visitors are scared or intimidated by nature. A ranger or tour guide can make visitors feel safe and provide the tools they need to feel a connection to nature. Martin (2004) concluded that the use of adventure activities (e.g. white water rafting) as the basis for educating people, promotes more environmental relatedness.

According to Haggard and Williams (1991), recreation can strengthen our identities and define who we are. In a study involving social connection between wilderness recreation and social change for women, Pohl, Borrie, and Patterson (2000) found that participating in wilderness recreation can influence women's everyday lives by leading to increases in self-sufficiency, perspective shifts, connection to others, and mental clarity. Some other outdoor recreation benefits include improved mental engagement, increased self-awareness, and clarification of values (Driver, Brown, & Peterson, 1991).

In addition, Borrie and Roggenbuck (2001) found that participants' feelings of care and connectedness for the environment were higher while they were in the park and after they exited the wilderness than when they first entered. Therefore, quality outdoor recreation experiences can result in a state of connectedness with the earth and its creatures, which in turn, can result in a greater sense of appreciation for the environment and the community of life (McDonald & Schreyer, 1991). Environmental interpreters have the ability to create these quality experiences for visitors by developing fun and educational programs for them to participate in.

Martin (1993) stated that taking groups into the wild can encourage environmentally sympathetic understanding; however, there may be a lack of outdoor education programs which enhance environmental connectedness while maintaining the adventure-based learning techniques. This illustrates why it is important to conduct research pertaining to interpreter led programs offered at state parks and measure the connectedness to nature of participants.

Additionally, in a study involving students pursuing their undergraduate degree in outdoor education, Martin (2004) found that the process of outdoor education actually helped shape students' relationships with nature toward an increased sense of connectedness to, and caring for, nature. In addition, respondents stated that the creation of culture and language obtained through this education helped them to think about and discuss their relationship with nature. Most people may not know a lot about the environment. This may be the reason why park visitors participate in naturalist or tour guided programs. This gives the tour guide the opportunity to help the visitor make a connection to the environment. This study will determine whether this is actually happening.

In summary, direct contact with nature can increase a person's connectedness with the natural environment. The research also illustrates the importance of the interpreter and the possible contributions to the visitor's experience and knowledge. Due to inconsistencies in measuring environmental attitude, measuring connectedness to nature is a better approach to fully assess a person's relationship to nature. Due to the lack of research on measuring connectedness to nature and park visitor involvement in structured and unstructured activities, the objective of this study is to determine whether structured activities influence connectedness to nature more than unstructured activities in infrequent park visitors.

Hypotheses

This study specifically seeks to establish a significant relationship between connectedness to nature and structured and unstructured recreational activities using the

Multi-dimensional Connection to Nature Scale. Based on the literature, the following hypotheses were developed:

H1: For both frequent and infrequent park users, participants in structured activities will have a significantly greater connection to nature than participants that engage in unstructured activities at a state park.

H2: For infrequent park visitors, participants in structured activities will experience a significantly greater connectedness to nature than participants in unstructured activities.

CHAPTER III

Methodology

The following section describes the methodology used to answer the major questions posed by this study. The design of the study is quantitative and the researcher administered assessment instruments. The sections immediately following will describe the research design, population, and instrumentation. Sample selection and descriptions are delineated. The chapter will then focus on variables of the study and data analysis.

Research Design

For this research project, a post-test only control group design was used to survey visitors at state parks. This means that surveys were distributed after participation in the structured activities. The Multi-dimensional Connection to Nature Scale was used to measure connectedness to nature in campground visitors. One survey was distributed to visitors at a Midwestern state park in the United States. Since most of the environmental interpreter/naturalist programs meet or were conducted at the two visitor centers, a random selection of visitors were surveyed around the two visitor centers and at the different campsites at the campground. Some campers did not visit the visitor center or participate in ranger-led activities so it was easiest to get them to fill out surveys at their individual campsites. Visitors were asked the number of times in the past twelve months they participated in each of the recreational activities listed on the survey. The data obtained from the surveys was used to evaluate any significant differences in the levels of connectedness to nature between participants in structured activities and unstructured activities.

Population and Sample

Subjects in this study were visitors staying at a state park in the Midwest. There were no environmental interpreter programs on Mondays and Tuesdays so surveys were taken from Wednesday, July 2nd to Sunday, July 6th, 2008. The surveys were completed voluntarily and subject selection was random to ensure a diverse sample. To ensure random sampling, every 5th person encountered was asked to fill out a survey. The survey subjects were 19 years of age or older. Surveys were distributed around the visitor center and around the campground. Subjects' identity remained anonymous and all surveys were kept confidential.

Survey Instruments

Connection to Nature, Multi-dimensional Connection to Nature Scale

Connection to nature was measured using the Multi-dimensional Connection to Nature Scale developed by Pennisi (2007). This assessment consists of 26 questions that include subscales regarding spirituality, awe, sorrow, identity, restoration, and fear. The assessment consists of a 5-point Likert-type scale. Initial confirmatory factor analysis showed the following Cronbach alpha levels in reliability: Spirituality ($\alpha = .91$), Awe ($\alpha = .87$), Sorrow ($\alpha = .86$), Identity ($\alpha = .89$), Restoration ($\alpha = .86$), and Fear ($\alpha = .89$). This assessment has been determined to be valid and reliable in initial testing. The assessment offers improvements over similar assessments Dunlap & Van Liere, 1978 Dunlap et al., 2000) in which the validity and reliability has been suspect.

The survey consisted of the Multi-dimensional Connection to Nature Scale with some additional questions regarding how many times the visitor has participated in a variety of recreational activities at the park. Finally, participants were asked to provide

some demographic information (for specific demographics, see Appendix A). On the survey there were two tables of activities: structured and unstructured recreational activities. In each of these tables, the activities were listed and the visitor indicated how many times they participated or planned to participate in each activity. The specific activities are listed on the survey located in Appendix A. Participants that selected both structured and unstructured activities, the activities were further examined. If structured activities were more prominent than unstructured activities and the unstructured activities listed included only a couple of hours of solo hiking, biking and camping, then they were put in the unstructured activity group. Because of how the park was set up, visitors had to hike/bike everywhere because park facilities were so spread out. In addition, everyone that was surveyed was camping.

Data Collection

Sample Selection and Collection Methods

This research project was conducted in the state park campground. Having a variety of ranger-interactive programs at the visitor centers and in the park was necessary for this study to fully evaluate the effect structured activities have on connectedness to nature. Subjects in this study were visitors to state park campgrounds. Participants were 19 years of age or older. Surveys were distributed to participants around the visitor centers and campsites. Every 5th randomly selected person completed one survey. All visitors filled out the survey on-site before departure. The specific place to hand out surveys was around the entrances to the visitor centers where people gathered for ranger-interactive activities and around individual campsites. For purposes of this study infrequent park visitors will be defined as those attending a park less than once per year.

Data Analysis

A quantitative assessment of the dependent (connectedness to nature) and independent variables (structured, guided-park activities/unstructured, unguided-park activities) was used in this study as tools to gain understanding of the guided park activities on connectedness to nature. Overall connection to nature was the mean of all 26 items on the scale. Fear was reversed scored. A Pearson Correlation was performed to determine whether or not independent variables were related to the six subscales of the dependent variable as well as the demographic variables. The subscale fear was reverse scored. Finally, an Independent Sample t-Test test was performed to test the significance between structured and unstructured activities on connection to nature.

Dependent and Independent Variables

The purpose of this study was to determine if structured activities result in more connectedness to nature than unstructured activities. This study investigated how changes in the independent variables affect the dependent variables. The variables were:

<u><i>Dependent Variable</i></u>	<u><i>Independent Variables</i></u>
Connection to Nature	<p><i>Structured activities</i></p> <ul style="list-style-type: none"> • Naturalist Program/Ranger-led programs • Backpacking • Hiking <p><i>Unstructured Activities</i></p> <ul style="list-style-type: none"> • Fishing/Hunting • Mountain Biking • Wildlife Viewing/Birding • Backpacking • Other • Horseback riding • Canoeing/Kayaking • Geocaching • Camping

CHAPTER IV Results

This chapter contains the results of the statistical analyses. The Multi-dimensional Connection to Nature Scale was used to measure park visitor's connection to nature. There were 221 usable survey responses.

Simple Statistics and Correlations

Descriptive statistics and an Independent Sample t-Test provided the basis of analysis of independent variables and dependent variables. Reliabilities of the inventories were conducted to ensure measures were consistent. Cronbach alpha reliabilities ranged from .69 to .91 for structured activities (Table 1) and .75 to .91 for unstructured activities (Table 2).

Variable means and standard deviations for both frequent and infrequent park visitor's participation in structured activities appear in Table 1. A significance level of .05 ($p < .05$) was used in the data analysis. Variable means and standard deviations for infrequent park user's participation in unstructured activities appear in Table 2. A significance level of .05 ($p < .05$) was used in the data analysis.

Table 1. Descriptive Statistics and Correlation Matrix for Structured Park Activities, Gender, Age, Ethnicity, Education Level, and Frequency of Park Visits (N = 81).

		Mean	S.D.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	Structured Activities	4.08	.40											
2.	Spirituality	3.5	1.05	.76**	(.91)									
3.	Awe	4.51	.46	.66**	.32**	(.71)								
4.	Sorrow	3.96	.72	.59**	.32**	.22	(.69)							
5.	Identity	3.74	.77	.91**	.67**	.54**	.53**	(.79)						
6.	Restoration	4.27	.48	.56**	.27*	.54**	.04	.37**	(.73)					
7.	Fear	4.54	.50	-.19	-.47**	-.10	-.29**	-.25*	-.03	(.74)				
8.	Gender	1.52	.50	-.04	.03	.06	.19	-.16	-.05	-.15				
9.	Age	46.89	11.48	.24*	.27*	.17	.16	.24*	.20	-.38	.03			
10.	Ethnicity	1.02	.16	-.03	-.06	.04	.04	-.03	.08	-.13	.17	.05		
11.	Education	5.30	1.72	.08	.10	.04	-.03	.11	.01	-.01	.11	-.09	.25	
12.	Frequency	3.02	.87	.04	-.07	.11	.10	.04	-.11	.19	-.11	-.10	.00	.04

Note. Reliability coefficient estimates (α) are in Parenthesis along diagonals. * $p < .05$; ** $p < .01$. (Two-tailed tests).

Table 2. Descriptive Statistics and Correlation Matrix for Unstructured Park Activities, Gender, Age, Ethnicity, Education Level, and Frequency of Park Visits (N = 140).

		Mean	S.D.	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1.	Unstructured Activities	.90	.50											
2.	Spirituality	3.2	1.10	.75**	(.91)									
3.	Awe	4.3	.66	.74**	.46**	(.76)								
4.	Sorrow	3.7	.79	.62**	.46**	.32**	(.77)							
5.	Identity	3.6	.70	.84**	.54**	.58**	.34**	(.76)						
6.	Restoration	4.15	.62	.80**	.41**	.65**	.32**	.74**	(.77)					
7.	Fear	4.41	.64	.12	-.18*	-.08	-.09	.04	.04	(.75)				
8.	Gender	1.49	.50	.04	.19*	.01	-.02	-.02	.07	-.19*				
9.	Age	43.58	14.98	.16	.11	.30**	.09	.17	.06	-.13	.33			
10.	Ethnicity	1.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00		
11.	Education	4.71	1.80	.13	.06	.00	.02	.24**	.14	.04	.09	.28**	.00	
12.	Frequency	3.26	.94	-.12	-.17	-.04	-.03	-.03	-.13	.07	-.19*	.18*	.00	.01

Note. Reliability coefficient estimates (α) are in Parenthesis along diagonals. * $p < .05$; ** $p < .01$. (Two-tailed tests).

The results in Table 1 show correlations between participation in structured activities, overall connection to nature, the six subscales of the Relationship to Nature Scale (spirituality, awe, sorrow, fear, identity, and restoration), and demographics. There was a significant positive relationship between structured activities and spirituality ($r = .76, p < .01$), awe ($r = .66, p < .01$), sorrow ($r = .59, p < .01$), identity ($r = .91, p < .01$), and restoration ($r = .56, p < .01$). There was also a significant positive relationship between overall connection to nature and age ($r = .24, p < .05$) in participants of structured activities.

Spirituality was significantly correlated with awe ($r = .32, p < .01$), sorrow ($r = .32, p < .01$), identity ($r = .67, p < .01$), and restoration ($r = .27, p < .01$). Spirituality was also significantly negatively correlated with fear ($r = -.47, p < .01$) and there was a positive correlation between spirituality and age ($r = .27, p < .05$). There was a significant correlation between awe and identity ($r = .54, p < .01$) and between awe and restoration ($r = .54, p < .01$). Sorrow was significantly correlated to identity ($r = .53, p < .01$) and negatively correlated to fear ($r = -.29, p < .01$). There was a positive significant correlation between identity and restoration ($r = .37, p < .01$) and age ($r = .24, p < .01$). There was also a negative correlation between identity and fear ($r = -.25, p < .01$).

The results in Table 2 show correlations between participation in unstructured activities, overall connection to nature, the six subscales of the Relationship to Nature Scale (spirituality, awe, sorrow, fear, identity, and restoration), and demographics. There was a significant positive correlation between connection to nature in unstructured activities and spirituality ($r = .75, p < .01$), awe ($r = .74, p < .01$), sorrow ($r = .62, p <$

.01), identity ($r = .84, p < .01$), and restoration ($r = .80, p < .01$). There was also a significant positive correlation between spirituality and awe ($r = .46, p < .01$), sorrow ($r = .46, p < .01$), identity ($r = .54, p < .01$), and restoration ($r = .41, p < .01$).

There was also a significant negative correlation between spirituality and fear ($r = -.18, p < .05$) and a positive correlation between spirituality and gender ($r = .19, p < .05$). In addition, there was a significant positive correlation between awe and sorrow ($r = .32, p < .01$), identity, ($r = .58, p < .01$), restoration ($r = .65, p < .01$), and age ($r = .30, p < .01$). There is a positive significant correlation between sorrow and identity ($r = .34, p < .01$) and between sorrow and restoration ($r = .32, p < .01$). There is also a significant positive correlation between identity and restoration ($r = .74, p < .01$) and between identity and education ($r = .24, p < .01$). Finally, there is a negative significant correlation between fear and gender ($r = -.19, p < .05$).

Data Analysis Using Independent Sample t-Tests

The following hypothesis related to connection to nature and participation in structured and unstructured activities was tested:

H1. For both frequent and infrequent park users, participants in structured activities will have a significantly greater connection to nature than participants that engage in unstructured activities at a state park.

An analysis using an Independent Sample t-Test indicated a statistically significant difference between connection to nature for participants in structured activities ($M = 4.1, SD = 0.4$) and connection to nature for participants in unstructured activities ($M = 3.9, SD = 0.5; t(219) = -2.79, p < .05$). Hypothesis 1 was supported. Descriptive

statistics are displayed in Table 3 and the results of the Independent Sample t-Test are displayed in table 4.

Table 3. Descriptive Statistics of connection to nature in participants that engaged in structured activities and unstructured activities.

	N	Mean	Std. Deviation
Unstructured Participants	140	3.90	.50
Structured Participants	81	4.08	.41

Table 4. Results of Independent Sample T-Test comparing connection to nature in participants in structured activities and unstructured activities.

	t-Statistic	df	p-value
Structured and Unstructured Participants	-2.79	219	.006*

* $p < .01$.

Figure 1 is a model of the difference between participation in structured and unstructured activities and connection to nature in visitors to a state park.

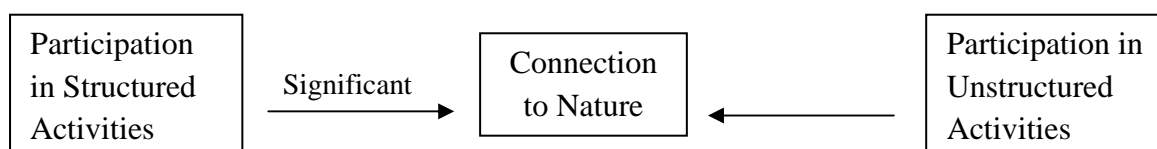


Figure 1. Model representation of the difference between participation in structured and unstructured activities and connection to nature.

The following hypothesis related to connection to nature and participation in structured and unstructured activities by infrequent park visitors was tested:

H2. For infrequent park visitors, participants in structured activities will have a greater connection to nature than participants in unstructured activities.

An analysis using Independent Sample t-Test indicated there was no statistically significant difference between connection to nature in infrequent park visitors that participated in structured activities ($M = 4.1, SD = 0.4$) and connection to nature in infrequent park visitors that participated in unstructured activities ($M = 4.0, SD = 0.5$; $t(113) = -1.35, p > .05$). Hypothesis 2 was not supported. Descriptive statistics are displayed in Table 5 and the results of the Independent Sample t-Test are displayed in Table 6.

Table 5. Descriptive Statistics of connection to nature in infrequent park visitors that participated in structured and unstructured activities.

Infrequent Park Visitors	N	Mean	Std. Deviation
Unstructured	62	3.96	.51
Structured	53	4.07	.39

Table 6. Results of Independent Sample t-Test comparing connection to nature in infrequent park visitors that participated in structured and unstructured activities.

Structured & Unstructured	t-Statistic	df	p-value
Infrequent Park Visitors	-1.35	113	.18

$p > .05$.

Figure 2 is a model of the difference between connection to nature in infrequent park visitors that participated in structured and connection to nature in infrequent park visitors that participated in unstructured activities.

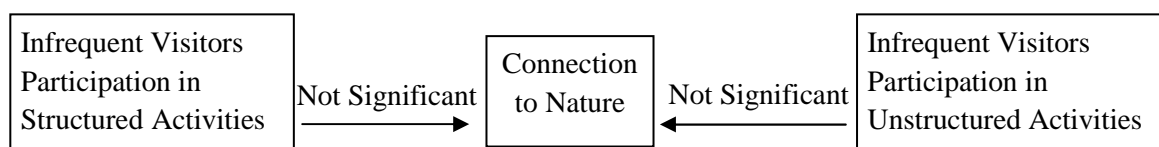


Figure 2. Model representation of the difference between connection to nature in infrequent park visitors that participated in structured and unstructured activities.

Although no hypotheses were developed, the relationship between connection to nature in frequent park visitors that participated in structured activities was compared to the connection to nature in frequent park visitors that participated in unstructured activities. An Independent Sample t-Test indicated a statistically significant difference between connection to nature in frequent park visitors that participated in structured activities ($M = 4.1$, $SD = 0.4$) and connection to nature in frequent park visitors that participated in unstructured activities ($M = 3.9$, $SD = 0.5$; $t(104) = -2.37$, $p < .05$). Frequent park visitors that participated in structured activities had a higher connection to nature. Descriptive Statistics are displayed in Table 7 and the results of the Independent Sample t-Test are in Table 8.

Table 7: Descriptive Statistics of connection to nature in frequent park visitors that participated in structured and unstructured activities.

Infrequent Park Visitors	N	Mean	Std. Deviation
Unstructured	78	3.86	.48
Structured	28	4.11	.43

Table 8. Results of Independent Sample t-Test comparing connection to nature in frequent park visitors that participated in structured and unstructured activities.

Structured & Unstructured	t-Statistic	df	p-value
Frequent Park Visitors	-2.37	104	.020*

* $p < .05$.

Figure 3 is a model of the difference between connection to nature in frequent park visitors that participated in structured and unstructured activities at a state park.

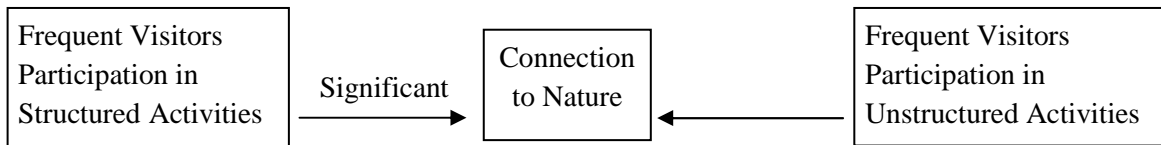


Figure 3. Model representation of the difference between connection to nature in frequent park visitors that participated in structured activities and connection to nature in frequent park visitors that participated in unstructured activities.

CHAPTER V

Discussion

A significant positive difference was found between connection to nature in park visitors who engage in structured activities than those who engage in unstructured activities; thus, Hypothesis 1 was supported. This result supports the contention that participation in structured activities at a state park can increase a person's connection to nature. Some of the causes underlying this finding could include the intimate outdoor setting for outdoor programs and the information being provided during a program. For example, during a guided hike, participants received information about plant communities, wildlife, and the park itself. Martin's (2004) study on education performed in an outdoor setting, found the process of outdoor education actually helped increase students' sense of connectedness to, and caring for, nature. It can be argued that structured programs do have a direct impact on a person's connection to nature.

Hypothesis 2, however, was not supported. For infrequent park users, there was no significant difference between connection to nature and participation in structured and unstructured activities. This is in contrast with the findings of Beaumont (2001) and Eagles and Demare (1999) who concluded that those with the least environmental experience and weakest attitudes initially will be influenced the most by the experience. It could be possible that infrequent park visitors do have a slight increase in connection to nature, but it is simply not significant in this study. Future studies could measure an individual's connection to nature before the program and then immediately after to determine specifically whether a park visitor's connection to nature changed after

participating in the program. The dates of the study could have also influenced the results. Surveys were taken over the 4th of July weekend and visitors could have been at the park for fireworks or other activities not nature related.

In addition, although not hypothesized, for frequent park visitors there was a statistically significant difference between connection to nature and participation in structured and unstructured activities. Frequent park visitors who participated in structured activities had a greater connection to nature than frequent park visitors who participated in unstructured activities.

There is a view that visitors to natural areas who engage in ecotours or interpretive programs already have pro-environmental attitudes for the environmental movement (Beckmann, 1991). It could be possible that frequent park users in this study already had a strong connection to nature prior to participation in the structured activity. Nonetheless, the structured activities in this state park appear to have a strong influence on those who frequently attend parks.

There is some evidence to support this finding. Asfeldt (1992) found that even in cases where pre-existing environmental concern is high, participation in an ecotour strengthened those existing attitudes. Thus, the increase in connection to nature in frequent park visitors may be limited; however, the results in this study indicate that connection to nature can be increased in frequent park visitors through structured activities.

On the other hand, several researchers have found that people who enter outdoor education, interpretive programs, and wilderness experience programs with already

strong pro-environment attitudes do not intensify those attitudes significantly as a result of participation in these activities (Beckmann, 1991; Eagles & Demare, 1999; and Gillett *et al.*, 1991). It may not be one specific activity that shapes a person's connection to nature. A frequent park user may engage in many structured programs and learn a wide range of information about natural areas. These experiences together can help shape their relationship with nature. Just as a relationship between two people can deepen and become more interconnected, so too can a person's relationship with nature. It appears that the specific structured activities, and the role of the interpreter, may be a major factor in determining if frequent park visitors increase their connection to nature.

In addition, the results show a significant positive relationship between structured activities and five of the connection to nature subscales: spirituality, awe, sorrow, identity, and restoration. The sixth subscale, fear, did not have a significant positive relationship with structured activities. Similarly, there were also significant positive correlations between participation in unstructured activities and five of the subscales: spirituality, awe, sorrow, identity, and restoration. Fear was not significantly correlated with unstructured activity. Both structured and unstructured activities were significantly correlated with connection to nature.

It was surprising that neither structured nor unstructured activities had a significant negative connection to fear. Anecdotal data suggested there would be a connection. For example, one person surveyed, who called herself an avid outdoors woman and camper, had just moved to a different campground because a black bear had come into their campsite and had gotten into the garbage. She was concerned about her

safety and the possibility of being attacked by a bear. Although she may have had a lengthy relationship with nature, she discussed how she respectfully feared nature because she knew humans were not always dominant. Perhaps people that spend a lot of time in the outdoors begin to realize how dangerous it can be to camp or backpack if they are not experienced or careful. An avid hiker in a park where bears live may come across one at some point.

There was a significant positive relationship between spirituality and fear to the gender of participants in unstructured activities. This seems to make sense because women seem to be more spiritual than men. Women are more religious than men on almost every level (Walter & Davie, 1998). Although spirituality doesn't necessarily mean religion, it is a form of spirituality. It also makes sense that women would be more fearful of the outdoors. Women tend to be more scared of snakes and spiders than men and may view nature differently. Also, women in urban areas are aware of the risks of walking alone in different neighborhoods and could transfer that fear to hiking alone in the woods.

There was also a significant positive relationship between overall connection to nature and age of participants in structured activities. In addition, age was also positively correlated with spirituality and identity. For unstructured activities, age was positively correlated with awe. These results seem reasonable because as a relationship with a person can deepen over time, so too can a relationship with nature. As a person spends more time in nature throughout their life, they can become more connected and familiar with the outdoor environment.

Implications for Practice

The results indicate that participating in structured activities can raise a person's connection to nature. This study will greatly benefit park systems by providing useful information to park personnel. Park managers and planners often have authority over ranger-led and environmental interpreter programs and activities; and it is important to know they are positively influencing connectedness to nature in park visitors. All parks are not the same in the types of programs and activities they offer and it is helpful to know if they are effective. Park managers should evaluate the effectiveness of their structured programs.

In addition, this information is valuable to park visitors. There are an increasing number of people that do not spend a lot of time outside (Pergams & Zaradic, 2006) and may not have a strong connection to nature. Knowing they can easily participate in a structured park program and gain some appreciation for the outdoors may make them more willing to participate. Simply getting an individual to participate in a quality structured program, one can provide them with the information necessary to create some form of connectedness to nature. This is why it's important for parks to develop effective structured programs for visitors to enjoy.

Not only will this information help park personnel and visitors, but it can help society on a broader scale. With increasing environmental concerns and future generations spending less time outdoors, these results make it clear we should be performing some education in an outdoor setting. Some state parks open up their programs to school or community groups. Parks should consider opportunities to increase

participation in these programs and create that connection to nature at a younger age. Having that direct experience in nature may make them more willing to conserve biodiversity and participate in other pro-environmental projects in the future (Zaradic & Pergams, 2007), and develop an ecocentric environmental attitude (Ewert, Place, & Sibthorp, 2005).

Implications for Research

In this study, frequent park visitors may have had low levels of connection to nature and therefore, participating in structured activities significantly raised their level of connectedness. To verify whether these results are consistent with a person's connection to nature, future studies could measure frequent park visitors' connection to nature before and after participation in a structured activity. This will determine whether their level of connection to nature changed after participating in the structured activity.

A lot of state parks offer outdoor education or naturalist programs. This study was performed in one state park and although the results could apply to other state parks, programs at parks may differ in structure and content. It could be inferred that these types of structured programs do have an impact on park visitors, but that doesn't necessarily imply all park programs will have such an impact. In addition, state parks have different levels of funding to hire and outdoor leaders or educators. As a result, programs will differ from park to park as well as the effectiveness and expertise of the guides.

Finally, this study combined all structured activities into one category. Future studies could determine if there is a difference in connection to nature based on the specific structured activity visitors engage in. This would provide useful knowledge to

park personnel because it would let them know which programs are the most effective in connecting visitors to nature and where to focus their efforts.

Strengths of Findings

This study is important because a significant relationship was found between connection to nature and participation in structured park activities. This specific topic had not been explored before and can be of great use to state parks. In addition, the results showed that frequent park visitors who participated in structured activities had a greater connection to nature than frequent visitors who participated in unstructured activities. Again, this topic had not been explored previously and does provide some valuable information to park personnel, park visitors, and the general public as a whole. It is important to know the possible benefits of participating in various activities during a park visit.

Limitations of Findings

Although the present findings indicate that participants in structured activities have a higher level of connection to nature than those that do not, some limitations should be acknowledged. This study did have a relatively small sample size. There were only 221 usable surveys distributed in a single state park in one state. Future studies could survey a larger sample size and distribute surveys in multiple parks of different sizes and in a variety of locations. This would give a more comprehensive overview of the impact of the different structured park programs on connection to nature. In addition, further studies could break up the individual naturalist or outdoor education programs and see if the type of program makes a difference with a visitor's level of connection to nature.

Also, surveys were taken over the 4th of July weekend. This may have impacted the study because visitors may not be your typical campers or they may not be there to spend time in nature, but to engage in fireworks or other 4th of July activities. Future studies could distribute surveys on multiple days throughout the season. Finally, it may also be helpful to measure connection to nature in infrequent park visitors before and after they engage in structured activities to see if there is an increase.

Directions for Future Research

Finally, participation in one guided park program is not enough. Beaumont (2001) suggested that for short-term effects of the experience on the infrequent park visitor to endure, there still needs to be motivations to stimulate and encourage further involvement in and learning about nature. People taking part in short national park interpretive programs often do so as part of a larger, overall trip and are far less inclined to be actively involved in behaviors aimed at conserving the natural environment (Beaumont, 2001). Therefore, it is important that this group be stimulated to adopt a conservation ethic. Perhaps the implementation of a comprehensive interpretive program at parks or other natural recreation areas might offer the necessary stimulation. This could include short, guided walks, interpretive talks or activities that incorporate affective techniques designed to encourage strong feelings which lead to a commitment to conservation.

Changing behavior, and thus sustaining a connection to nature, is a complex process (Geller, 1992; Ham & Weiler, 2002; Hines, Hungerford, & Tomera, 1987). For behavioral change to occur there must be both a variety of developmental experiences

and also the ability and opportunity to learn from these experiences (Barbuto and Etling, 2002). Future research in connection to nature should explore these factors.

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Appendix A – Survey Instrument

Park Visitor Survey

Use the following scale to rate your level of agreement with each of the following statements. There are no right or wrong answers – just your answers. Read each statement and answer as honestly about yourself as you can.

	Scale: Entirely Disagree	Somewhat Disagree	Neutral	Somewhat	
Agree	Entirely Agree				
	1	2	3	4	5

- _____ 1. Watching wildlife fills me with awe. (*Awe*)
 _____ 2. I feel sorrow because we are destroying too much nature. (*Sorrow*)
 _____ 3. I have spiritual feelings that are nature-based. (*Spirituality*)
 _____ 4. Hiking in the wilderness would make me nervous. (*Fear*)
 _____ 6. My feelings towards nature form a big part of my identity. (*Identity*)
 _____ 17. Time in natural areas breaks down all the stress until I feel completely refreshed. (*Restoration*)

Activities: Please state the number of times you have participated in the following activities during the past 12 and the number of times you intend to participate in each activity during the next 12 months.

<i>Structured Activity</i>	# of times in past 12 mos.					# of times in future 12 mos.				
	0	1-3	4-7	8-12	>12	0	1-3	4-7	8-12	>12
Naturalist Program (Please list)										
Backyard Composting										
Capture the Great Outdoors										
Guided Hike										
Bird Banding Demonstrations										
Primitive fire/shelter/rope making										
Mommy and Me Fall Fling										

<i>Unstructured Activity</i>	# of times in past 12 mos.					# of times in future 12 mos.				
		1-3	4-7	8-12	>12		1-3	4-7	8-12	>12
Hiking/Biking										
Fishing/Hunting										
Wildlife Viewing/Birding										
Horseback riding										
Canoeing/Kayaking										
Backpacking										
Camping										
Other (please specify)										

Finally, we are interested in matching people with their attitudes. These answers will be kept anonymous.

- Are you? male OR female
- What is the year of your birth? 19____
- How many hours do you spend in an average month in outdoor recreation activities mentioned above?_____
- Which of these best describes your race or ethnic group? (Check any that apply)

<input type="checkbox"/> Native American	<input type="checkbox"/> African American	<input type="checkbox"/> Latino or Hispanic
<input type="checkbox"/> Asian	<input type="checkbox"/> Caucasian	<input type="checkbox"/> Pacific Islander
<input type="checkbox"/> Multi-racial	<input type="checkbox"/> Other (please specify)_____	
- What is the highest level of education you have completed? (Please mark one)

<input type="checkbox"/> Less than High School Grad	<input type="checkbox"/> Associate Degree	<input type="checkbox"/> Some Graduate School
<input type="checkbox"/> High School Graduate or GED	<input type="checkbox"/> Some College	<input type="checkbox"/> Graduate or Prof. Degree
<input type="checkbox"/> Technical School	<input type="checkbox"/> College Graduate	
- When was the last time you visited a state park?

<input type="checkbox"/> Not in the past year	<input type="checkbox"/> Not in the past 5 years
<input type="checkbox"/> Once in the past year	<input type="checkbox"/> More than once in the past year

APPENDIX B - Institutional Review Board Letter of Approval

To: mburbach@unlnotes.unl.edu,chelwest@hotmail.com
 From: nugrant-irb@unl.edu
 Subject: NUgrant Message - Official Approval Letter for IRB project #8800
 Date: Wed, 21 May 2008 15:56:23 -0500
 X-MIMETrack: Itemize by SMTP Server on UNLNOTES.UNL.EDU/Servers/UNEBR(Release 7.0.2FP2 HF144|July 27, 2007) at 05/21/2008 03:56:23 PM,
 Serialize by POP3 Server on UNLNOTES01.UNL.EDU/Servers/UNEBR(Release 7.0.2FP2 HF144|July 27, 2007) at 05/21/2008 04:10:00 PM
 May 21, 2008

Chelsea West
 School of Natural Resources
 7018 Shamrock Rd Lincoln, NE 68506

Mark Burbach
 School of Natural Resources
 512 HARH UNL 68583-0995

IRB Number: 2008058800 EX
 Project ID: 8800
 Project Title: CONNECTION TO NATURE IN PARK VISITORS: A LOOK AT STRUCTURED AND UNSTRUCTURED RECREATIONAL ACTIVITIES

Dear Chelsea:

This letter is to officially notify you of the approval of your project by the Institutional Review Board (IRB) for the Protection of Human Subjects. It is the Board's opinion that you have provided adequate safeguards for the rights and welfare of the participants in this study based on the information provided. Your proposal is in compliance with this institution's Federal Wide Assurance 00002258 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46) and has been classified as exempt.
 Date of EX Review: 5/21/08

You are authorized to implement this study as of the Date of Final Approval: 05/21/2008. This approval is Valid Until: 05/20/2009.

The approved informed consent form has been uploaded to NUgrant (West ICF-Approved.pdf file). Please use this document to distribute to participants. If you need to make changes to the informed consent form, please submit the revised form to the IRB for review and approval prior to using them.

We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:

- Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
- Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
- Any publication in the literature, safety monitoring report, interim result or other finding that indicates an unexpected change to the risk/benefit ratio of the research;
- Any breach in confidentiality or compromise in data privacy related to the subject or others; or
- Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

This project should be conducted in full accordance with all applicable sections of the IRB Guidelines and you should notify the IRB immediately of any proposed changes that may affect the exempt status of your research project. You should report any unanticipated problems involving risks to the participants or others to the Board. For projects which continue beyond one year from the starting date, the IRB will request continuing review and update of the research project. Your study will be due for continuing review as indicated above. The investigator must also advise the Board when this study is finished or discontinued by completing the enclosed Protocol Final Report form and returning it to the Institutional Review Board. If you have any questions, please contact the IRB office at 472-6965.

Sincerely,
 Dan Hoyt, Chair for the IRB

Appendix C - Study Participant Informed Consent Form



INSTITUTE OF AGRICULTURE AND NATURAL RESOURCES
SCHOOL OF NATURAL RESOURCES

Title: Connection to Nature in Park Visitors

You are about to participate in a research project related to the connection to nature in park visitors. The purpose of the study is to evaluate the effects of structured and unstructured activities on visitor's connection to nature. This study is being conducted by the University of Nebraska-Lincoln (UNL). You must be 19 years of age or older to participate in this study. You are invited to participate in this study because of your visit to a public park.

Participation in this research will require approximately 10 minutes of your time. There are no known risks or discomforts associated with this research. There are also no direct benefits to you for participating in this study.

Any information obtained during this study that could identify you will be kept strictly confidential. The data will be stored in a locked cabinet in the investigators' offices and will only be seen by the investigators during the study and for three years after the study is complete. The information obtained in this study may be published in scientific journals or presented at scientific meetings but the data will be reported as aggregated data.

You may ask any questions concerning this research and have those questions answered before agreeing to participate. Or, you may call the investigators at anytime. Chelsea West's phone number is (605) 261-8942, and Dr. Mark Burbach's office phone number is (402) 472-8210. If you have any questions concerning your rights as a research participant that have not been answered by the investigator, or to report any concerns about the project, please contact the University of Nebraska-Lincoln Institutional Review Board, phone (402) 472-6965.

You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators, your instructors, the University of Nebraska-Lincoln or the park you are visiting. Your decision will not result in any loss of benefits to which you are otherwise entitled.

You are voluntarily making a decision whether or not to participate in this research study. **By completing the questionnaire your consent to participate is implied. Please keep this letter for your records.** Thank you very much for helping with this study.

Sincerely,

Chelsea D. West
Graduate Student, Principal Investigator